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What is the role of economics and business studies in the development of attitudes in favour of sustainability?

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ABSTRACT

Purpose: The aim of this paper is to find out what attitudes Economics and Business students have towards sustainability and what they expect from their education in relation to the achievement of economic, social and environmental sustainability. The objective is to find out if the studies of Economics and Business favor the development of pro-sustainability attitudes, taking into account factors such as the gender of the students, the course in which they are enrolled, and the economic training received before entering university.

Design/methodology/approach: A survey was designed covering ecological, social, cultural, economic and political aspects. The survey was conducted among students of the Bachelor's Degree in Business Administration and Management and the Bachelor's Degree in Economics. The authors used discriminant analysis and analysis of variance to test the research hypothesis.

Findings: Students are concerned about environmental problems and are aware of the need for action, but there is little consensus on the actions needed to overcome them. Some negationist traits are detected: those who rely more on technology give less importance to environmental problems and to the possibility of a major ecological catastrophe. Girls are more in favor of sustainability than boys, and students who have previously studied economics consider that their training has enabled them to evaluate the resources available and necessary to perform any job more than those who have not studied economics, regardless of their sex and year.

Originality/value: Many articles have focused on the importance of sustainability in higher education, but hardly any have analysed the role of economic education in achieving sustainability. Given the importance and the proven interrelationship between economics and sustainability, with this article, we contribute to fill the gap in the literature. It is necessary that current students and future professionals receive adequate economic education.

Keywords: economics; sustainability; higher education for sustainable development; gender; pro-sustainability attitudes.

1. INTRODUCTION

Today, hardly anyone disputes the increasing deterioration of ecosystems, the loss of biodiversity or climate change and, in short, the planetary emergency situation in which we find ourselves (Jakučionytė-Skodienė & Liobikienė, 2021). In the face of this challenge facing humanity, the key role of education and learning in strategies to promote

society's transition to sustainability is recognised (Berchin et al., 2021; Manolis & Manoli, 2021).

The agreements and initiatives that have contributed to the understanding and advancement of sustainability and environmental education are numerous. In the 1970s, the Stockholm Conference on the Human Environment organised by the United Nations marked the turning point in international policy on environmental issues and highlighted the importance of education. Parallel to this process, the concept of sustainable development, understood as "development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs" (Brundtland, 1987:16), was also consolidated and disseminated. And education appears as an indispensable strategy for achieving sustainable development in numerous international initiatives. This was reflected in both the 1990 Talloires Declaration and the 1993 Copernicus Charter, where higher education institutions committed themselves to introduce sustainability into the curriculum. The importance of education in this field increased significantly, with UNESCO establishing the Decade of Education for Sustainable Development 2005-2014. This agreement contains the main themes to be considered in order to integrate the values inherent to sustainable development: promoting peace, biodiversity, combating poverty and gender inequality, reducing inequalities, promoting quality education, combating global warming and establishing healthy and sustainable lifestyles with sustainable urbanisations (UNESCO, 2005).

More recently, the 2030 Agenda for Sustainable Development was adopted by the UN General Assembly in 2015 with the aim of, among other things, eradicating poverty, reducing inequalities and promoting quality education (Fritz et al., 2019; Carlsen & Bruggemann, 2021), with the fourth Sustainable Development Goal (SDG) dedicated to education. Education thus becomes a key element in promoting pro-sustainability attitudes, values and behaviours (Chaleta et al., 2021).

Different research has emphasised the relationship between sustainability and higher education. Leal Filho et al. (2015) describe the achievements of higher education institutions through Education for Sustainable Development during the period 2005-2014. They show the need for greater commitment from the entire university community to improve sustainability education. It has also become clear that despite the interest and the need to implement sustainability in education, in practice progress is less, mainly due to the lack of continuity of the actions carried out and resistance to change (Ávila et al., 2019). There is a need to introduce sustainability in a holistic way, including it not only in curricula but also in university management, research and dissemination (Figueiró et al., 2022).

Progress has been made in including sustainable development in the curricula of higher education institutions (Lozano et al., 2019), investigating what competences they have or should offer to help sustainability and what SDGs are being or could be worked on. Brundiers et al. (2021) identify key competences for structuring curricula so that learning outcomes promote sustainability. Chaleta et al. (2021) identify the SDGs that could be developed from the courses offered at the Faculty of Social Sciences of the University of Évora in Portugal. Poza-Vilches et al. (2021) present the SDGs most present in the curricula of the faculties of Andalusia (Spain). Alm et al. (2022) analyse how the SDGs are integrated in higher education institutions, in particular at Kristianstad University in Sweden, and conclude that working with the SDGs encourages students to be more sustainable in their daily lives.

In order to move towards a more sustainable world, innovation capacities and a culture of sustainability are promoted in educational institutions, particularly in higher education institutions, involving students, graduates, teachers and administrators, and the complexity of the problem makes it essential to contribute to the various scientific fields, such as the natural and social sciences. In this sense, the key role of economics, as a discipline and as an activity that interacts with society and the environment, stands out in order to achieve sustainable development (Bugallo-Rodríguez & Vega-Marcote, 2020; Basu, 2021).

The process of sustainable development is underpinned by a healthy economy whose objectives should be aimed at eliminating poverty and making good use of resources. This is evident, for example, in the development of the circular economy, which is a strategy for the simultaneous achievement of economic performance, social inclusion and environmental improvement for the benefit of current and future generations (Geissdoerfer et al., 2017). To move towards the circular economy, the work of the private sector and government support is important as well as the role of higher education in promoting the necessary changes in knowledge, skills and behaviours towards sustainability.

The students in the fields of Economics and Business will be the future decision-makers in the field of production and consumption, and will act as a reference point for other groups. Hence the importance of knowing what their perceptions, attitudes and pro-sustainability behaviors are and what their economic training offers them to advance on the road to sustainability. This will make it possible to determine formative and transforming experiences to change those habits and inadequate actions and to generate the impulse for new sustainable actions.

The factors that may condition the pro-sustainability perceptions, attitudes and behaviours of university students are diverse. Some researchers have pointed to gender as one of them (Vicente-Molina et al., 2018; Cifuentes-Faura et al., 2020). Other studies have considered the influence of certain disciplines and the number of years of study (Manresa et al., 2021) as well as social and cultural factors (Cordano et. al., 2010).

The aim of this paper is to find out whether Economics and Business studies favour the development of pro- sustainability attitudes, what students who follow these programs think about sustainability and what they expect from their education in relation to the achievement of economic, social and environmental sustainability. This will take into account factors that may influence pro-sustainability behavior, such as gender, the course in which they are enrolled and the economic training received before entering university. This leads us to pose the following research questions:

Q1: What is the level of students' knowledge and attitudes towards environmental sustainability?

Q2: What is the students' perception of the training they are receiving in sustainability?

Q3: What is the possible effect (in Q1 and Q2) of gender, the course in which they are enrolled and the economic training received before entering university?

Universities generate and transmit knowledge. By including content and actions related to sustainability they can promote positive changes in the sustainability-friendly behaviour of their students. And taking into account that students in the fields of economics and business will be the future entrepreneurs and professionals who must act in an ethical, responsible and sustainable way when they assume positions in various

economic sectors, the contribution of this work is relevant, because it will serve as guidance for academic decision-makers to implement the most appropriate educational policies focused on sustainability.

The structure of the paper is as follows. Section 2 presents a theoretical background on the importance of economics for sustainable education; section 3 presents the methodology used; section 4 the results; section 5 the discussion; and finally, section 6 the main conclusions.

2. THEORETICAL BACKGROUND

Economics plays a major role in society's overall thinking and in the making of many decisions by policy makers. Economic decisions and policy initiatives implemented, as well as programmes and projects promoted by governments or the private sector have an impact on the environment. Depending on the regulatory and policy framework of economic decisions, sustainable agriculture, ecotourism, clean energy, sustainable natural resource management or the opposite can be promoted. The economy is therefore closely linked to achieving sustainability (Vargas Pineda et al., 2017). However, the economic system has generally prioritised immediate or short-term profit over long-term benefits and ecosystem health. In other words, in this decision-making framework, neither the rights of future generations, nor the rights of non-human beings, nor the conservation of nature, nor the negative consequences of its deterioration for society and nature itself are sufficiently and adequately considered (Câmara, 2014).

The interactions between the economic system and the environment are continuous. On the one hand, the economy receives energy and raw materials; on the other hand, it has a significant impact on nature by dumping waste, consuming renewable and non-renewable resources, or modifying the functioning of ecosystems through interventions. Human action has not ceased to transform the environment in a process that has accelerated since the industrial revolution and has done so in multiple ways: expanding agricultural crops and livestock farms, building cities and occupying coasts and the most fertile land, building roads, railways, regulating rivers, etc. (Crane et al., 2021). These decisions generate an environmental impact that can be solved, in part, by taking advantage of the materials in the environment, reducing, reusing and recycling in order to minimise the generation of waste and residues through the circular economy. In the current context of change, the position of the economy in a transition towards sustainability is considered key, with the development of concepts such as the green economy or the circular economy.

The United Nations Conference for Sustainable Development held in Rio in 2012 focused on the importance of implementing the concept of green economy, thus seeking to generate structural economic change through a multidimensional strategy that promotes sustainable development. The United Nations Environment Programme describes the Green Economy as one that seeks to improve human well-being and social equity (Charan & Venkataraman, 2017), reduce environmental risks and pressure on natural systems, and harmonise economic development and efficient resource consumption (D'Amato et al., 2017). The concept of green economy is not intended to replace that of sustainable development. In fact, the green economy is more related to concepts linked to weak sustainability (energy efficiency or pollution control) than to elements requiring profound social transformations.

It is clear that economics, the environment and sustainable development are closely related, and that the economic education received influences the conception of problems and the decisions taken in relation to environmental protection and conservation (Noguera-Méndez & Cifuentes-Faura, 2022). However, there are degrees such as those related to economics that are still more oriented towards the market and profit maximisation than towards sustainability pedagogy (Molera et al., 2021). This is why it is important not only to have teachers committed to sustainable development, but also for higher education to consider the relevance of economic education in relation to changes that accelerate the transition to sustainability. There is a need to promote social innovation using new tools and techniques to achieve sustainable development (Leal Filho et al., 2022).

In addition, students' behaviour is easily shaped by stimuli from their immediate environment, such as family, friends and education. A variety of factors can shape pro-sustainability perceptions, attitudes and behaviours among students. Kagawa (2007) found that students engaged in sustainable practices, such as recycling or using public transport, when it required only small lifestyle changes. In the same vein, Boyes et al. (2009) found that willingness to engage in certain sustainable behaviours was higher when the activities required little effort and caused little disturbance. Motivation is another factor that can influence pro-sustainability behaviour. According to Stern et al. (1993) concern for the environment is due to a combination of three values: egoistic, social-altruistic and biospheric, with the egoistic orientation having the greatest impact on motivation for certain behaviours. However, as this work highlights, selfish orientation can only be a motivating element for pro-sustainability behaviour when the action serves the needs and desires of the individual. Other work suggests that pro-environmental and pro-sustainability behaviour is positively related to altruistic values (Khachatryan et al., 2013), which are more linked to women (Vicente-Molina et al., 2018).

Studies have shown that students in the final years of school generally show greater environmental awareness than those in the first stage of education (Stark & Guy, 2016). Students' understanding of sustainability increases as they receive more information on this topic, as students in the early grades do not yet tend to have such holistic thinking or value the repercussions and responsibilities of their actions as much (Stark & Guy, 2016). Along the same lines are the results of Mónus (2022), which analysed the attitudes and behaviors of students in Hungarian secondary schools.

Gender is another major factor affecting favourable attitudes towards sustainability. The vast majority of works agree that women show more favourable pro-sustainability attitudes than men (Zelezny et al., 2000; Xiao & McCright, 2015; Cifuentes-Faura et al., 2020; Maartensson & Loi, 2022). The literature suggests that these differences may be related to sociological theories of gender that show disparities in gender roles and status in the early socialisation process (Gilligan, 1993). Differences between women and men are often linked to gender roles and associated practices (Bloodhart & Swim, 2020).

People with a higher level of environmental knowledge tend to develop behavior more favorable to environmental protection and sustainability (Zsóka et al., 2013). In addition, higher educational attainment is often associated with higher environmental knowledge, and generally with more pro-environmental behaviour (Xiao & McCright, 2014). The type of studies can also affect individuals' pro-environmental attitudes. Social science students tend to have a more favourable attitude than pure science students (Talay et al., 2004). Manresa et al. (2021) conclude that the introductory courses in economics that students receive in high school allow them to have an initial understanding and awareness of ethical implications. On the other hand, individuals who believe that their

own efforts can solve environmental problems have more pro-sustainability attitudes and behaviours (Tobler et al., 2012).

Culture and country-specific factors also influence pro-environmental behaviour, as environmental problems are not perceived in the same way in all countries (Cordano et al., 2010). People also tend to learn more about the environment through the media or the internet, which can encourage environmentally friendly behavior in society by promoting environmental responsibility and influencing pro-environmental attitudes (Xiao et al., 2022).

3. METHODOLOGY

In order to test the hypotheses on the relationship between studying business and economics and pro-sustainability attitudes, considering aspects related to gender, length of study and course, a survey was designed covering ecological, social, cultural, economic and political aspects (Purvis et al., 2019; Fischer et al., 2020). The questionnaire is an adaptation of several studies that analyse students' perceptions of sustainability and the training they have received in this area. The importance of students' environmental literacy has been considered based on Juárez-Nájera et al. (2010) and Eagle et al. (2015). The scale has been adapted from the paper of Disterheft et al. (2015) to find out what they think about the training received in sustainability. And based on Koljatic & Silva (2015), the necessary elements for understanding the role of business and economics education in social and environmental issues were determined in order to determine the role of business and economics studies in the development of favourable attitudes towards sustainability. A Likert-type scale with five options was used, where 1 means strongly disagree and 5 means strongly agree.

The survey consists of 40 questions grouped into four blocks: A, B, C and D (all questions can be consulted in the Appendix). Block A determines the degree of knowledge about environmental issues. Block B refers to the attitude towards environmental. These two blocks are intended to answer research question Q1. Block C determines whether the training received throughout their lives has favoured their sustainability commitments, and finally, block D focuses on determining their view on sustainable education in economics and business studies.

For the first two blocks, a factor analysis was performed to summarise all available information into a smaller set of factors with as little loss of information as possible. KMO and Bartlett's tests allow us to verify the suitability of the data for exploratory factor analysis. Varimax rotation has been used to better delineate the relationship between the observed variables and the resulting factors. The number of latent factors in each block was determined using the Kaiser criterion. To assess reliability, Cronbach's alpha was calculated. From the factors, a single indicator was obtained for each block as a weighted average of the subscales, the weighting being the percentage of variance explained by each factor.

For blocks C and D, which relate training and sustainability, given that the necessary conditions for a factor analysis were not met (KMO values below 0.5 and factors that are difficult to interpret), each item was analyzed separately. These blocks are intended to answer research question Q2. In addition, to determine whether gender, the course in which they are enrolled and the economic training received before entering university influence their knowledge and actions related to sustainability, a factorial analysis of variance has been carried out. This is intended to answer question Q3.

The survey was carried out through an online questionnaire among students of the Bachelor's Degree in Business Administration and Management and the Bachelor's Degree in Economics at the University of Murcia (Spain) in November 2021. In October, a pre-test was carried out with ten pupils from these grades to evaluate the items in the questionnaire for ambiguity, clarity and appropriateness. Taking into account the comments made, the final questionnaire was drafted. It was answered by 146 students. With a 95% confidence, an expected proportion of 50% and an error of 6%, the sample size is adequate. The results obtained are presented below.

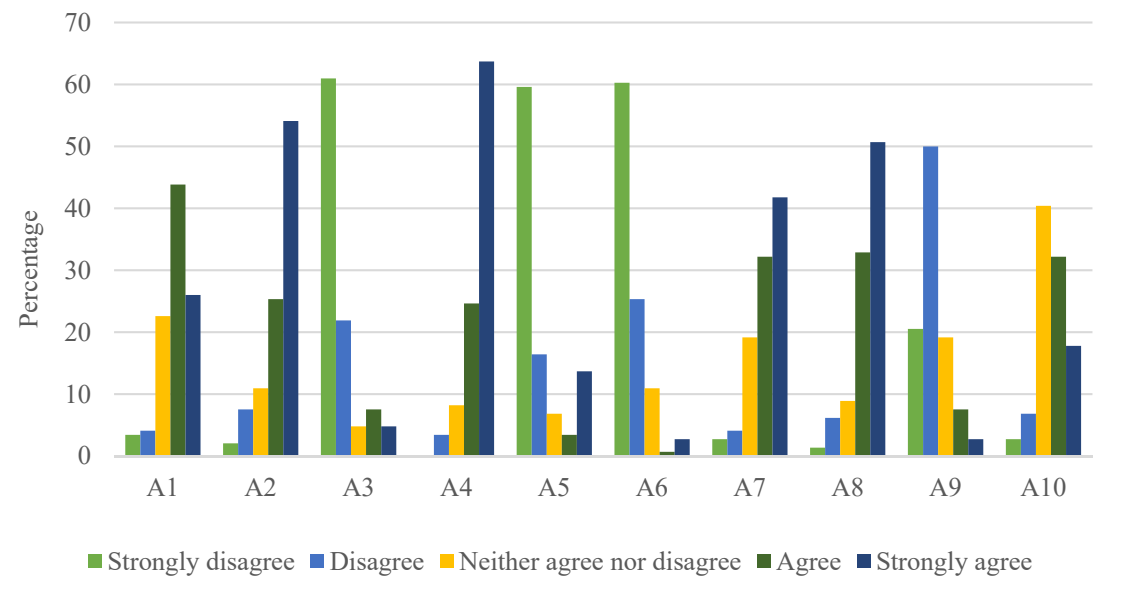
4. RESULTS

The age of the students who responded to the survey ranged from 17 to 38 years, 89% of whom were under 24 years old. 54.1% are girls and 42% are enrolled in the first or second year. Around 70% have studied some economics subject before entering university. It should be borne in mind that in Spain there are three main fields of study for university entrance: the arts baccalaureate, the science and technology baccalaureate and the humanities and social sciences baccalaureate. In general, students who wish to pursue a career related to Economics and Business complete their previous studies in the area of humanities and social sciences, in which economics subjects are taught.

4.1. Environmental sustainability knowledge and attitudes

Blocks A and B of the survey refer to attitudes and knowledge about environmental sustainability. Cronbach's alpha for the whole sample was 0.91, indicating that the questionnaire scales are valid and reliable. Block A shows (Figure 1) that almost 90% of the respondents agree or strongly agree that human-induced climate change is getting worse (A4) and a similar proportion believe that if things continue on their present course, we will soon experience a major ecological catastrophe (A8). 83% of students strongly disagree or disagree that environmental problems are being exaggerated (A3) and 71% that climate change cannot be stopped (A9).

Figure 1. Degree of agreement on knowledge about environmental sustainability.



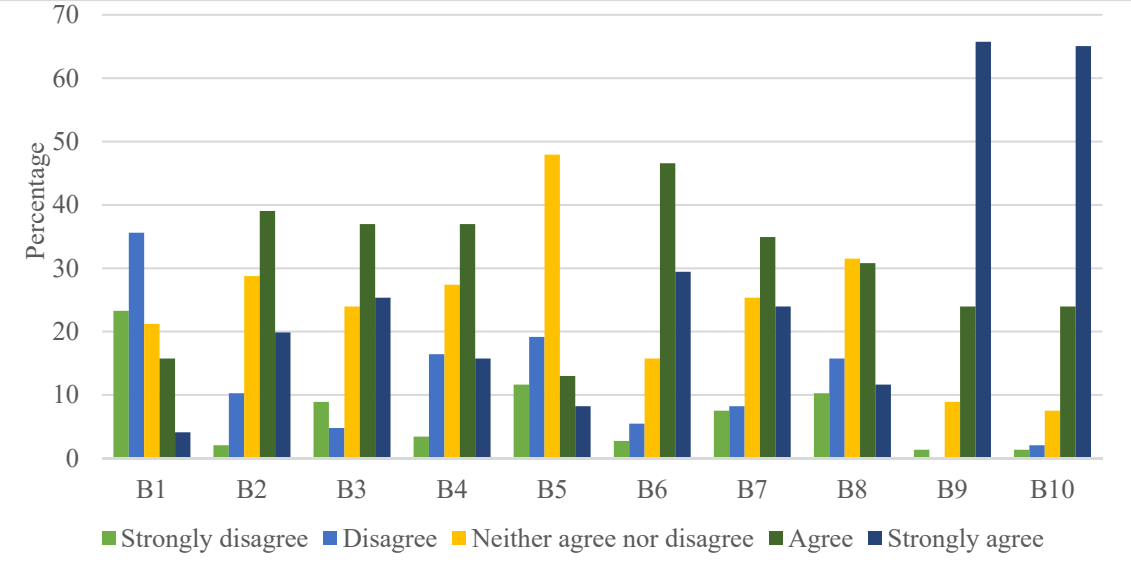
Note: A1: Climate change for family; A2: Climate change for country; A3: Ecological crisis; A4: Climate change worsens; A5: Unlimited resources; A6: Human modifies nature; A7: Harmony with nature; A8: Ecological catastrophe; A9: Pace of climate change; A10: Technology and solutions.

Source: Own elaboration

There is a negative correlation of A10 with A1, A2 and A8, which shows negationist traits: those who rely more on technology (A10), give less importance to environmental problems (A1 and A2) and to the possibility of a major ecological catastrophe (A8).

In terms of attitudes towards sustainability, Figure 2 shows that 90% of students believe that both business and government should act to combat climate change (B9, B10). However, more than 40% think that they can do little in this area and furthermore, they do not feel an obligation to do all they can to alleviate the situation. What they do (76% agree or strongly agree) is to try to reduce consumption, reuse and recycle; and, to a lesser extent, to use less private transport and air conditioning (B7) as well as to avoid buying from companies that do not show concern for the environment (B8).

Figure 2. Attitude towards environmental sustainability.



Note: B1: Climate change measures; B2: Personal obligation; B3: Use of coal, oil and gas; B4: Sustainability products; B5: Use of personal computer; B6: Recycling; B7: Transport and food; B8: Avoid buying from a company; B9: Business emissions; B10: Government emissions

Source: Own elaboration

4.1.1. Exploratory factor analysis

In order to have a more global view of all these issues while minimising the loss of information, a factor analysis has been carried out. The value of the KMO coefficient is 0.736, which indicates that the use of this methodology is appropriate for these data.

Three factors were obtained that explain about 60% of the variability of the data. Table 1 shows these factors after a varimax rotation. The first factor (A_{F1}) associated with the importance students attach to climate change (questions A1, A2, A4, A7 and A8). The second factor (A_{F2}) associated with the role of humans and technology in the ecological

crisis (A3, A5, A6 and A10). The third factor (A_{F3}) referring to the pace of climate change consists of a single item "We cannot slow down the pace of climate change" (A9).

Table 1. Factor analysis of items in block A

Variables	A_{F1}	A_{F2}	A_{F3}
A1. Climate change for family	0.770		
A8. Ecological catastrophe	0.753		
A7. Harmony with nature	0.713		
A2. Climate change for country	0.614		
A4. Climate change worsens	0.554		
A3. Ecological crisis		0.658	
A5. Unlimited resources		0.607	
A10. Technology and solutions		0.598	
A6. Human modifies nature		0.448	
A9 Pace of climate change			0.854
w_i (%variance explained)	27.79%	17.04%	12.14%

Once the variables that make up each factor have been identified, the value of that factor has been obtained as the average of the scores of the variables that make it up. In order to ensure that the items are all favourable towards sustainability and to facilitate their interpretation when comparing results, those that are contrary to sustainability have been recoded. For example, in A3: "I think environmental problems are exaggerated, the so-called "ecological crisis", a high score would indicate that little importance is given to issues related to problems such as climate change. This variable has been recoded so that a score of 5 becomes 1, 4 becomes 2 and so on up to 1, which becomes 5.

From the indicators of each factor, an indicator (I_A) of sustainability has been obtained as a weighted average, the weighting being the percentage of variance explained by each of them in the corresponding factor analysis. The equation that expresses this relationship is given by:

$$I_A = \frac{27.79A_{F1} + 17.04A_{F2} + 12.14A_{F3}}{27.79 + 17.04 + 12.14} \quad (1)$$

The second block focuses on respondents' attitudes towards sustainability. Three factors were obtained that explain 61% of the variance and a KMO coefficient of 0.799. The first factor (B_{F1}) is associated with the personal contribution to improving the environment (B2, B4, B6, B7 and B8). The second factor (BF2) is related with the need for action by citizens, government and business (B1, B9 and B10). The third factor (B_{F3}) refers to the use of assets and materials that may affect sustainability (B3 and B5).

Table 2. Factor analysis of items in block B.

Variables	B_{F1}	B_{F2}	B_{F3}
B8. Avoid buying from a company	.830		
B2. Personal obligation	.804		
B4. Sustainability products	.778		
B6. Recycling	.688		
B7. Transport and food	.466		
B1. Climate change measures		-0.712	
B10. Government emissions		0.690	
B9. Business emissions		0.674	
B5. Use of personal computer			0.814
B3. Use of coal, oil and gas			0.795
w_i (%variance explained)	29.37%	16.84%	14.64%

With this information, a single indicator has been obtained as a weighted average of the three sub-indicators, recoding items B1 and B3:

$$I_B = \frac{29.37B_{F1} + 16.84B_{F2} + 14.64B_{F3}}{29.37 + 16.84 + 14.64} \quad (2)$$

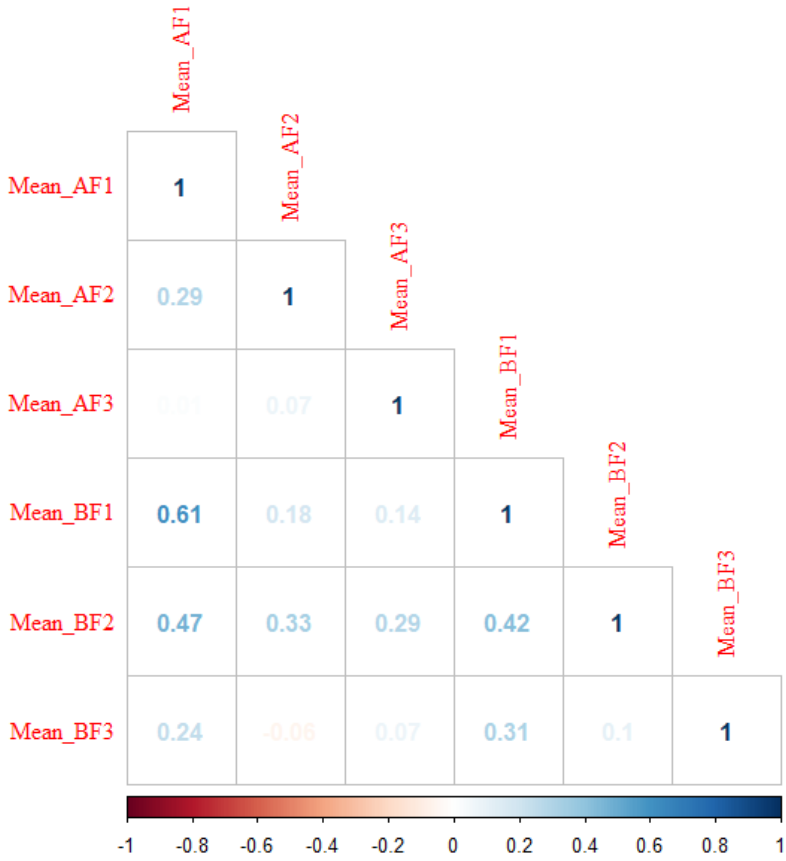
The main descriptions of the factors found and the indicators calculated are shown in Table 3. In all subscales the maximum score is 5 and the minimum is in B_{F1} and B_{F3}. The highest mean, above 4, is obtained in B_{F2} and A_{F1}, reflecting the students' great concern about environmental issues and the need for action, both personal and by companies and government, to improve sustainability. The mean of the global indicator on knowledge of environmental issues is higher than that of the indicator on pro-environmental attitudes and, moreover, has a lower coefficient of variation, which shows that there is more consensus on environmental concerns than on the actions needed to improve them.

Table 3: Descriptive measures of the indicators on environmental knowledge and attitudes.

	Min	Max	Mean	Std. Deviation	Coef. variation
A_{F1}	1.80	5.00	4.174	0.670	0.161
A_{F2}	1.50	5.00	3.789	0.687	0.181
A_{F3}	1.00	5.00	3.781	0.950	0.251
I_A	2.25	4.85	3.975	0.486	0.122
B_{F1}	1.00	5.00	3.563	0.803	0.225
B_{F2}	1.67	5.00	4.201	0.664	0.158
B_{F3}	1.00	5.00	3.260	0.916	0.281
I_B	1.65	4.90	3.667	0.593	0.162

The correlation between the different indicators is positive (Figure 3), being higher between A_{F1} and B_{F1}, so that the greater the knowledge of environmental problems (A_{F1}), the greater the personal commitment to combat them (B_{F1}).

Figure 3. Correlation between the different indicators



Source: Own elaboration

4.1.2. Analysis of the differences in knowledge and attitude according to different factors.

An analysis of variance (Anova) (Table 4) is used to analyse whether there are differences in these indicators according to gender, year (two categories are distinguished: students in the first two years and those in the last two years) and having previously studied economics, taking into account possible interactions between them. Both previous studies and gender influence students' perceptions of the importance of climate change issues (A_{F1}). Students who have studied economics in upper secondary school reveal more pro-environmental attitudes and behaviour and girls give more importance to climate change than boys.

Table 4: Anova on indicators of knowledge and attitude towards environmental sustainability: F-statistic (p-value in parentheses).

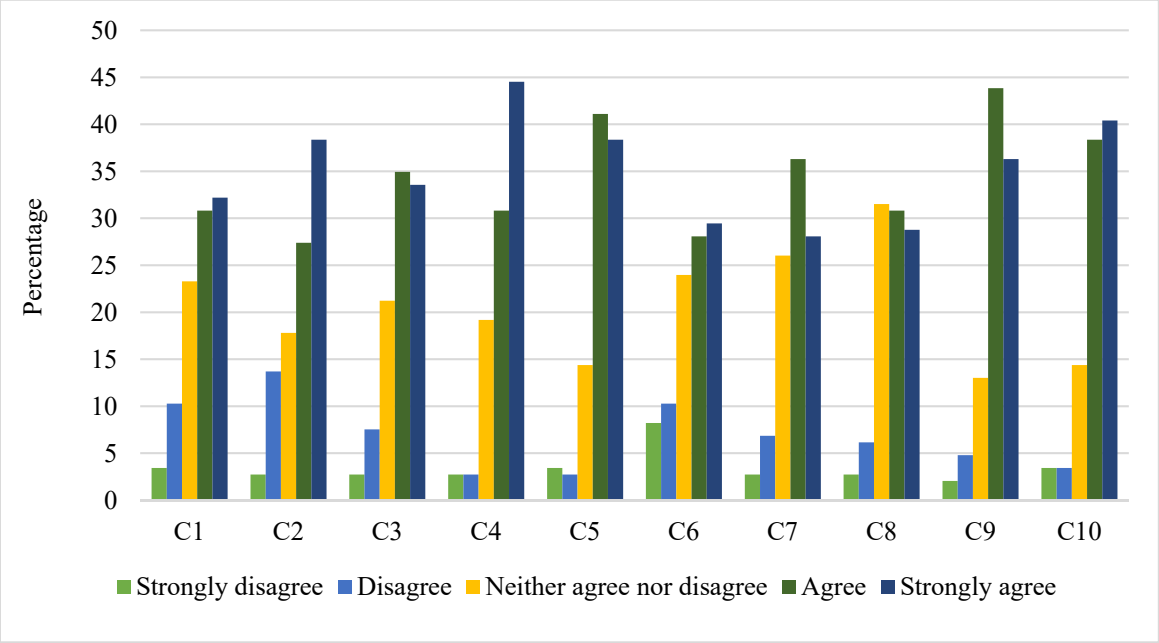
	EcoBacc	Gender	Course	EcoBacc*Gender	EcoBacc*Course	Gender*Course
A_{F1}	4.550	14.089	1.601	0.646	0.040	0.772
	(0.035)	(0.000)	(0.208)	(0.423)	(0.842)	(0.381)
A_{F2}	0.395	1.738	0.031	0.034	0.342	0.932
	(0.530)	(0.190)	(0.86)	(0.854)	(0.560)	(0.336)
A_{F3}	0.046	0.102	0.011	0.645	0.921	0.459
	(0.831)	(0.750)	(0.916)	(0.423)	(0.339)	(0.499)
$\mathbf{I_A}$	1.106	10.38	0.937	0.011	0.658	0.018
	(0.295)	(0.002)	(0.335)	(0.918)	(0.419)	(0.892)
B_{F1}	0.853	6.595	1.230	0.450	1.242	0.732
	(0.357)	(0.011)	(0.269)	(0.504)	(0.267)	(0.394)
B_{F2}	0.993	2.351	0.264	1.140	0.016	0.332
	(0.321)	(0.127)	(0.608)	(0.287)	(0.900)	(0.565)
B_{F3}	0.050	0.047	0.014	0.007	0.219	0.263
	(0.824)	(0.829)	(0.906)	(0.932)	(0.641)	(0.609)
$\mathbf{I_B}$	0.675	4.918	0.360	0.537	0.251	0.031
	(0.413)	(0.028)	(0.550)	(0.465)	(0.617)	(0.861)

Personal contribution to improving the environment (B_{F1}) is higher for girls than for boys, irrespective of prior economic education. In both global indicators on knowledge and attitude, I_A and I_B, girls again have higher scores. In short, based on the analysis carried out, it can be affirmed that women reveal more pro-environmental attitudes and behaviour than men.

4.2. Training received on sustainability

Block C considers whether the training received contributes to achieving skills favourable to sustainability, with a generally high level of agreement. In items C4, C5, C8 and C9, more than 75% of respondents perceive the questions on training received as fairly or very important. Only in two of the ten questions asked, C6 and C8, less than 60% of the students indicate the highest scores (Figure 4).

Figure 4. Training received by students to achieve sustainability.



Note: C1: Vision of a sustainable society; C2: Change towards sustainability; C3: Collaborative problem solving; C4: Working together; C5: Evaluate resources; C6: Sustainability agenda; C7: Analyze problems; C8: Uncertainty predictions; C9: Repercussions of actions; C10: Understand the future

Source: Own elaboration.

This is reflected in the main descriptions of the variables referring to the training received by the students (Table 5). The average scores are around 4, with the most highly valued items (4.1 out of 5) being those related to working together beyond differences, taking into account the resources available, understanding the future as something open that can be transformed.

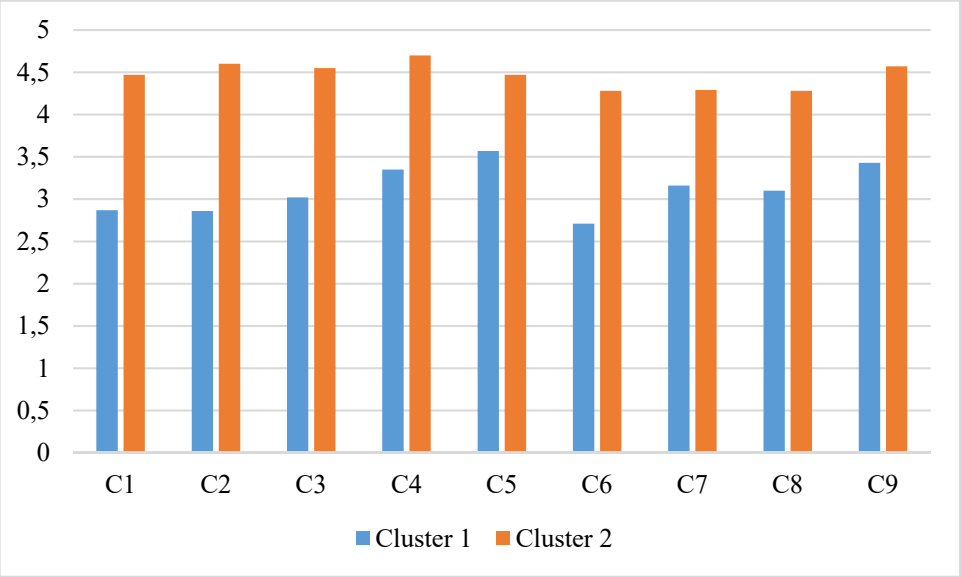
Table 5. Descriptive of the variables referring to the training received by the students.

	Min	Max	Mean	Std. Deviation
C1. Vision of a sustainable society	1	5	3.8	1.111
C2. Change towards sustainability	1	5	3.8	1.159
C3. Collaborative problem solving	1	5	3.9	1.045
C4. Working together	1	5	4.1	0.993
C5. Evaluate resources	1	5	4.1	0.972
C6. Sustainability agenda	1	5	3.6	1.240
C7. Analyze problems	1	5	3.8	1.015
C8. Uncertainty predictions	1	5	3.8	1.024
C9. Repercussions of actions	1	5	4.1	0.933
C10. Understand the future	1	5	4.1	0.996

A discriminant/cluster analysis was carried out to determine whether, with the variability shown in the assessments made, with such extreme responses in all these questions, it is possible to identify groups of students with different behaviours. Two

distinct groups were obtained, with un 63 and 83 students. The mean scores of each group is shown in Figure 5. Group 2 is characterised by a score above 4.5 on all questions with a lower dispersion, indicating that the training they have received will help them to solve problems. These students are mainly female, in higher education and with previous training in economics.

Figure 5. Mean of clusters of students with different behavioral patterns



Note: C1: Vision of a sustainable society; C2: Change towards sustainability; C3: Collaborative problem solving; C4: Working together; C5: Evaluate resources; C6: Sustainability agenda; C7: Analyze problems; C8: Uncertainty predictions; C9: Repercussions of actions; C10: Understand the future

Source: Own elaboration.

On the other hand, the KMO value (less than 0.5) indicates that it is not appropriate to perform a factor analysis, so an analysis of variance has been performed taking into account the factors gender, course and whether they have studied economics before together with the possible interaction between each pair of factors, for each of the items separately. The significance of the different analyses is shown in Table 6.

Table 6. Anova on training received on sustainability: F-statistic (p-value in parentheses).

	EcoBacc	Gender	Course	EcoBacc*Gender	EcoBacc*Course	Gender*Course
C1	1.951 (0.165)	0.043 (0.837)	0.719 (0.398)	3.399 (0.067)	2.222 (0.138)	0.037 (0.849)
C2	0.201 (0.654)	6.517 (0.012)	0.573 (0.45)	0.052 (0.820)	2.798 (0.097)	0.002 (0.965)
C3	3.182 (0.077)	1.865 (0.174)	2.712 (0.102)	0.501 (0.480)	3.678 (0.057)	0.530 (0.468)
C4	3.535 (0.062)	0.231 (0.632)	0.261 (0.61)	0.964 (0.328)	3.766 (0.054)	1.708 (0.193)
C5	5.465 (0.021)	1.146 (0.286)	1.628 (0.204)	1.218 (0.272)	2.217 (0.139)	0.055 (0.816)
C6	0.617 (0.433)	5.463 (0.021)	0.246 (0.621)	0.002 (0.966)	4.119 (0.044)	0.349 (0.556)
C7	1.183 (0.279)	0.057 (0.811)	0.093 (0.761)	0.333 (0.565)	0.130 (0.719)	1.210 (0.273)

C8	0.361 (0.549)	0.15 (0.699)	0.004 (0.952)	0.903 (0.344)	0.002 (0.965)	0.193 (0.661)
C9	0.530 (0.468)	1.473 (0.227)	0.064 (0.800)	2.185 (0.142)	0.270 (0.604)	0.046 (0.830)
C10	0.952 (0.331)	1.625 (0.205)	0.039 (0.843)	0.053 (0.818)	1.772 (0.185)	0.001 (0.982)

There is no interaction between gender and course in any of the items assessed. There is an interaction for item C6: "Develop practical tools to advance a sustainability agenda", with a significance of 5%, between the factors course of study and type of bachelor's degree. This interaction shows that the difference between students in the first years of the degree and higher years is smaller when they have studied Economics in the bachelor's degree (First years: Mean (M)=3.84, Standard Deviation (SD)=1.17; higher years: M=3.51, SD=1.24) than when they come from another type of bachelor's degree without Economics (First years: M=3.22, SD=1.35; higher years: M=3.73, SD=1.24). In addition, students with previous studies in economics value training in practical tools for sustainability more highly if they are starting university studies than students in the final years. If they have not studied economics before entering university, third and fourth year students value it more than first and second year students.

There is an interaction between the factors gender and studies with a significance level of 10% for item C1: “Articulating a vision of a fair and sustainable society”. The difference by gender between those who have previously studied economics and those who have not, is greater among students who have previously studied economics, with females being more likely to value a greater training in having a sustainable vision of society if they have previously studied economics, and less than that of males if they have not received economics training.

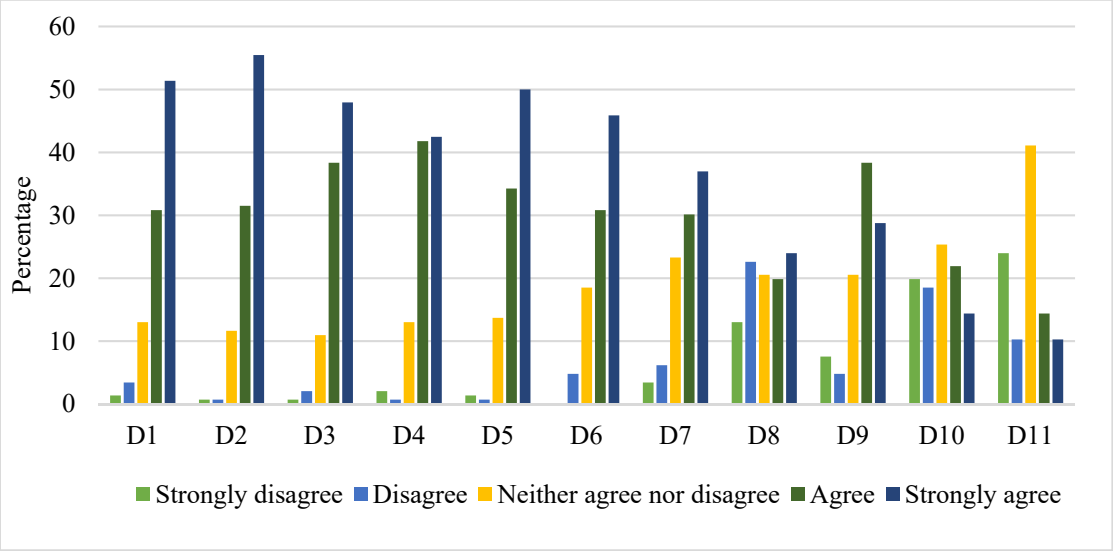
The course itself is not a factor that makes it possible to differentiate between the mean values of these items. On the other hand, there are significant differences at 5% according to gender, in the average assessment of C2 and C6. Girls consider that the training they have had has positively motivated them towards sustainability and has given them practical tools for it, more than boys, regardless of whether they have studied economics before or not and regardless of the year they are in.

In terms of pre-university studies, those who have studied economics consider that their training has enabled them to evaluate the resources available and necessary to carry out any job (C5) more than those who have not studied economics, regardless of gender and year of study.

4.3. Sustainability training that should be provided by business and economics faculties.

The percentage of students who gave a very high score to the different items related to the training that Economics and Business schools should provide, in relation to economic, social and environmental problems, is over 85%. These students consider that they should not focus more on teaching effective leadership in business, leaving social problems to those who specialise in their solutions (D8). In line with this assessment is the evaluation of the inclusion of discrimination issues (D9). Furthermore, they do not consider that Business and Economics students are, in general, less committed and less aware of environmental and social problems than students of other degrees (D10) (Figure 6).

Figure 6. Training that should be provided by business and economics faculties.



Note: D1. Business leaders; D2. Economic problems; D3. Social problems; D4. Environmental problems; D5. Awareness of the needs; D6. Solve social problems; D7. Solve environmental problems; D8. Business leadership, leaving social problems behind; D9. Inclusion of discrimination issues; D10. Less engaged than students of other degrees

Source: Own elaboration

The mean scores are above 4 for most items, with the lowest value for the item 'There are really no limits to economic growth that can continue uninterrupted' (a value of less than 3 out of 5), followed by the view that these studies should focus on teaching effective leadership in business, leaving social problems to those who specialise in their solutions (Table 7).

Table 7. Descriptive information on the training that should be provided by economics and business schools.

	Min	Max	Mean	Std. Deviation
D1. Business leaders	1	5	4.3	.9137
D2. Economic problems	1	5	4.4	.7753
D3. Social problems	1	5	4.3	.8014
D4. Environmental problems	1	5	4.2	.8509
D5. Awareness of the needs	1	5	4.3	.8351
D6. Solve social problems	2	5	4.2	.8997
D7. Solve environmental problems	1	5	3.9	1.0759
D8. Business leadership, leaving social problems behind	1	5	3.2	1.3712
D9. Inclusion of discrimination issues	1	5	3.8	1.1465
D10. Less engaged than students of other degrees	1	5	2.9	1.3344

An Anova was carried out to determine whether there are differences between the mean scores according to sex, year and type of bachelor's degree (Table 8), and only the

interaction between previous studies and year was significant at 5% in the assessment of item D7: Economics and Business graduates should know how to help solve environmental problems, as it is expected that the training received in Economics and Business centres will generate knowledge about the different areas of sustainability.

Table 8. Anova on sustainability training that should be provided by economics and business schools: F-statistic (p-value in parenthesis).

	EcoBacc	Gender	Course	EcoBacc*Gender	EcoBacc*Course	Gender*Course
D1	0.887 (0.348)	10.781 (0.001)	1.685 (0.196)	0.445 (0.506)	0.557 (0.457)	0.103 (0.749)
D2	0.203 (0.653)	8.591 (0.004)	3.073 (0.082)	0.400 (0.528)	0.057 (0.812)	0.496 (0.482)
D3	0.007 (0.935)	18.482 (0.000)	0.153 (0.696)	1.277 (0.260)	0.003 (0.954)	0.100 (0.752)
D4	0.778 (0.379)	15.556 (0.000)	7.158 (0.008)	0.736 (0.392)	0.848 (0.359)	0.200 (0.655)
D5	0.208 (0.649)	3.909 (0.050)	1.943 (0.166)	0.016 (0.899)	0.586 (0.445)	2.687 (0.103)
D6	0.070 (0.792)	0.749 (0.388)	4.315 (0.040)	0.847 (0.359)	0.180 (0.672)	0.434 (0.511)
D7	2.457 (0.119)	10.63 (0.001)	7.016 (0.009)	1.064 (0.304)	4.940 (0.028)	0.247 (0.620)
D8	0.056 (0.813)	0.027 (0.869)	0.11 (0.741)	0.464 (0.497)	1.354 (0.247)	2.153 (0.145)
D9	0.019 (0.889)	8.751 (0.004)	4.757 (0.031)	0.078 (0.781)	1.952 (0.165)	1.529 (0.218)
D10	0.085 (0.771)	1.236 (0.268)	0.028 (0.866)	0.926 (0.338)	0.302 (0.583)	0.000 (0.996)

There is interaction in item D7 (Economics and Business graduates should know how to help solve environmental problems) between previous studies and year. Students in the final years of the degree show significantly higher scores than those in the first years. Moreover, in the 3rd-4th year group, those with no previous studies in economics give higher ratings. For first and second year students, the opposite is true, as those with previous studies in economics gave higher evaluations than those without and gave a much lower average than those in higher years, who do not consider it important that Economics and Business graduates should help to solve environmental problems

Analysing the main effect of each of the factors, it can be seen that there are no differences between students coming from different baccalaureate programmes in terms of what they expect from training in sustainability in economics and business schools. On the other hand, there are differences according to gender and year. The mean scores for items D1, D2, D3, D4 and D9 are different according to gender. Girls score higher than boys in all of them, irrespective of whether or not they have studied economics before and irrespective of the year. In items D4, D6 and D9, related to the training that Economics and Business Studies should offer in the different areas of sustainability, students in higher grades give a higher average score than the rest of the students.

6. DISCUSSION

From the analysis of the answers obtained from the student survey, it has been possible to find out whether Economics and Business studies favour the development of pro-environmental attitudes, to evaluate the attitude towards sustainability of the students of Economics and Business and to find out what they expect from their education with regard to sustainability. Another objective of the study was also considered: to find out whether there are differences according to gender, the year to which they belong and whether they have previously studied economics. All this information can be used both to monitor and evaluate the actions carried out by educational institutions in their efforts to integrate sustainability and to guide the planning of future actions.

The overall indicator calculated from the factor analysis shows that there is more awareness of environmental concerns than of the actions needed to improve them. These results indicate the limitations and superficiality of learning about sustainability, as it does not offer guidelines for action from the students' point of view, since they are unaware of the actions needed to advance sustainability. This allows us to answer question Q1. If we take into account the different factors that can model these responses (Q3), the results show that the previous studies in economics and gender influence students' perceptions of the importance of climate change issues. Students who have studied economics during their A-levels have more pro-environmental attitudes and behaviour, and girls attach more importance to this issue than boys. The personal contribution to improving the environment is higher for girls than for boys, regardless of their previous economic education. These conclusions are in line with most of the existing literature (Zelezny et al., 2000; De Silva & Pownall, 2014; Cifuentes-Faura et al., 2020). Women are more involved in sustainability, more aware of the existing problem and feel the need to act (Pearson et al., 2017).

Regarding the students' perception of the training they are receiving on sustainability (Q2), the majority of respondents agree quite strongly with the training they have received. Business and Economics students believe that they should not focus more on teaching effective leadership in business, and therefore should not leave social problems only to those who specialise in their solutions. Nor do they consider that they are less committed and aware of environmental and social problems than students of other degrees. In response to Q3, it is worth noting that students in the first years who have done a bachelor's degree without economics do not consider it so important that Economics and Business graduates have to help solve environmental problems. Girls give a higher score than boys for training in sustainability, and students in higher years give a higher average score than the rest of the Economics and Business students.

Girls give more importance to climate change than boys, and students with a bachelor's degree in economics give more importance to climate change than students with no prior economic training. Girls consider that the training received has given them practical tools and motivates them towards sustainability more than boys, irrespective of whether they have previously studied economics and irrespective of the year they are in. Students who have studied economics before entering university consider that their training has enabled them to evaluate the resources available and necessary to carry out any job more than those who have not studied economics, regardless of their gender and course. The difference between business and non-business students could be rooted in the potential goal conflicts that can occur when environmental, social, and economic elements are combined (Dickel, 2018).

In addition, students with previous studies in Economics value sustainable training more highly if they are starting university studies than those in the final years. If they have not studied economics before entering university, students in their third and fourth years value this training more highly than those in their first and second years. Girls give more importance to climate change than boys, and students with a degree in economics give more importance to climate change than students with no previous training.

In terms of training received on sustainability, the difference between students in the first years of the degree course and those in higher courses is lower if they have received economic training before university entrance. When students are younger, they are more concerned about sustainability and its initiatives, so in high school the training received on sustainability in economics subjects is highly valued (Manresa et al., 2021). Later, when students think they already know a lot about the subject, they give less importance to it, because they have internalized it.

7. CONCLUSIONS

Education and learning are key to achieving sustainability and avoiding increasing environmental degradation or climate change. In a context of changes such as the current one, the role of the economy is essential to achieve the path towards sustainability, and in particular, the economic education received over the years. This education will influence the conception of problems and the decisions taken by students and future professionals in environmental protection.

As educational institutions are striving to introduce sustainability, it is important to monitor and evaluate the actions taken. It is therefore useful to know the level of knowledge, attitudes and perceptions of students in order to promote high quality curricula. A system of evaluation and monitoring of the process of transition towards sustainability in higher education is absolutely necessary, especially in the studies most closely related to sustainability, such as economics. It is necessary to evaluate changes in students' attitudes and values; to know how education for sustainable development has impacted on students. It is precisely along these lines that this work, in relation to sustainability, analyses students' knowledge, attitudes and perceptions of learning. In order for this evaluation to be effective, it should be systematic and continuous over time.

Given the importance and the proven interrelationship between economics and sustainability, it is necessary that current students and future professionals receive adequate economic education. This is very important because the habits that people have are a very strong barrier to making a change in their behavior.

Based on the results obtained, some policies can be put forward to improve the education system and lead society to progress towards the SDG. Economics teachers and textbooks should explain how the economy and society relate to nature, integrating environment and sustainability in an intersectional way, describing basic concepts such as consumption, human welfare or economic growth. Learning should promote critical thinking in economic decision-making, enabling future professionals to make appropriate decisions in line with sustainability. To this end, it would be advisable to carry out activities in which students apply the knowledge acquired to real situations of everyday life, and see the real importance of the economy in achieving sustainability, leaving aside the simple memorisation of theoretical knowledge on sustainability.

The inclusion of indicators based on sustainable values in student performance assessments can provide a way to address the elements of sustainability, thus helping to

reinforce its most essential goals and principles. Given also the more pro-sustainability attitude of women than men, it is recommended that mixed working groups be set up to work on economic aspects, so that they feed back to each other the knowledge and competences acquired. In this way, students learn from each other, and discover the importance of cooperating to solve real economic problems that affect the sustainability of the planet.

This work also has some limitations. The survey was carried out in only one faculty of economics and business and although the sample size is adequate to represent the students of this faculty, it would be useful to have information from other faculties. Thus, it would also be possible to analyze whether the spatial factor is an element to be taken into account to understand the importance of these studies in the field of sustainability. Possible lines of future research include increasing the sample size and obtaining information from other faculties, both national and foreign, or using qualitative research to investigate the perceptions of the different subjects involved.

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APPENDIX

Indicate the degree of agreement/disagreement with the following statements: (1=Strongly Disagree, 2= Disagree, 3= Neither Agree nor Disagree, 4= Agree, 5= Strongly Agree)

A1. Climate change is a major issue for me and my family.
A2. Climate change is a major issue for the country.
A3. I think that environmental problems, the so-called "ecological crisis", are exaggerated.
A4. Human-induced climate change is getting worse.
A5. Our planet has unlimited resources.
A6. Human beings have the right to modify nature as they wish.
A7. Humanity will become extinct if we do not live in harmony with nature.
A8. If things continue on their present course, we will soon experience a major ecological catastrophe.
A9. We cannot slow the pace of climate change.
A10. Technology and technical progress will most likely provide solutions to all future environmental problems.

Indicate the degree of agreement/disagreement with the following statements:

B1. There are few measures you can take to reduce the threat of climate change.
B2. I feel a personal obligation to do everything I can to prevent climate change.
B3. Every time we use coal, oil or gas we contribute to climate change.
B4. Sustainability is important to me when I choose the products or services I select.
B5. My use of my personal computer contributes to climate change.
B6. In my daily life I try to reduce consumption, reuse what I can and recycle.
B7. I try to use private transport and air conditioning as little as possible and take care not to throw food away.
B8. I avoid buying from a company that does not show concern for the environment.
B9. Business and industry should reduce their emissions to help prevent climate change.
B10. The government should take strong action to reduce emissions and prevent global climate change.

The training I have received has enabled me to:

C1. Articulating a vision of a fair and sustainable society.
C2. Motivating positive change towards sustainability in others.
C3. Seek collaborative problem solving.
C4. Working together across differences.
C5. Evaluate the resources available and necessary to carry out any work.
C6. Developing practical tools to advance a sustainability agenda.
C7. Analyse complex problems by drawing on multiple disciplines.
C8. Coping with uncertainty and future predictions.
C9. Consider the possible repercussions of our actions and decisions before implementing them.
C10. Understand the future as open-ended and something we can help shape.

Indicate the degree of agreement/disagreement with the following statements (1=strongly disagree to 5=strongly agree).

D1. Business and economics schools should prepare students to be civic leaders as well as business leaders.
D2. Business and economics schools should provide opportunities for students to increase their understanding of economic issues in the community.
D3. Business and economics education institutions should provide opportunities for students to increase their understanding of social problems in the community.
D4. Business and economics education institutions should provide opportunities for students to increase their understanding of environmental issues in the community.
D5. Good economic and business education makes students aware of the needs of less fortunate citizens.
D6. Economics and Business graduates should know how to help solve social problems.
D7. Economics and Business graduates should know how to help solve environmental problems.
D8. Business and economics studies should focus on teaching effective leadership in business, leaving social problems to those who specialise in their solutions.
D9. Business and economics studies should include discrimination issues.
D10. Economics and Business students are, in general, less committed and less aware of environmental and social issues than students of other degrees.